

# ONKYO® SERVICE MANUAL

## AUDIO VIDEO CONTROL RECEIVER MODEL TX-SV454



### Black and Silver models

BMD	120V AC, 60Hz
BMP, BMPIT, BMPA, SMP	230V AC, 50Hz
BMWWT	120/220V AC, 50/60Hz

### SAFETY-RELATED COMPONENT WARNING

COMPONENTS IDENTIFIED BY MARK ▲ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

**ONKYO**  
AUDIO COMPONENTS

# SPECIFICATIONS

## AMPLIFIER SECTION

### Power Output

#### Stereo mode

**Front L/R channels:** 70 watts per channel, min. RMS at 8 ohms, both channels driven from 20 Hz to 20 kHz with no more than 0.08% total harmonic distortion.

**Continuous Power output:** 2 × 80 watts at 8 ohms, 1 kHz (DIN)

#### Surround mode

**Front L/R and Center channels:** 60 watts per channel, min. RMS at 8 ohms, both channels driven from 20 Hz to 20 kHz with no more than 0.08% total harmonic distortion.

**Rear channels (Rear only driven):** 20 watts per channel, min. RMS at 8 ohms, both channels driven from 20 Hz to 20 kHz with no more than 0.3% total harmonic distortion.

### Total Harmonic Distortion:

0.08% at rated power (Front)

0.08% at rated power (Front)

60 at 8 ohms (Front)

### Sensitivity and Impedance

**Phono:** 2.5 mV/50 kohms

**CD, Multi-CH, Tape Play:** 150 mV/50 kohms

**Tape Rec:** 150 mV/2.2 kohms

**Subwoofer Pre out:** 2 V/2.2 kohms

**Phono Overload:** 120 mV RMS at 1 kHz, 0.5% T.H.D.

**Frequency Response:** 20 Hz to 30 kHz, ±1 dB

**RIAA Deviation:** 20 Hz to 20 kHz, ±0.8 dB

### Tone Control

**Bass:** ±10 dB at 100 Hz

**Treble:** ±10 dB at 10 kHz

### Signal-to-Noise Ratio

**Phono:** 80 dB (IHF A, 5 mV input)

**CD/Tape:** 100 dB (IHF A)

## VIDEO SECTION

### Signal sensitivity and impedance:

1 Vp-p, 75 ohms  
(VDP/VCR input, output)

## TUNER SECTION

### FM

**Tuning Range:** 87.5 — 108.0 MHz

### Usable Sensitivity

**Mono:** 11.2 dBf, 1.0 µV (75 ohms)  
**Stereo:** 18.2 dBf, 2.2 µV (75 ohms)

### 50 dB Quieting Sensitivity

**Mono:** 18.2 dBf, 2.2 µV (75 ohms)  
**Stereo:** 39.2 dBf, 24 µV (75 ohms)

### Capture Ratio:

1.5 dB

### Image Rejection Ratio

**U.S.A. & Canadian models:** 40 dB  
**Other area models:** 85 dB

### IF Rejection Ratio:

90 dB

### Signal-to-Noise Ratio

**Mono:** 73 dB

**Stereo:** 67 dB

### Alternate Channel Attenuation:

55 dB

### Selectivity:

50 dB (DIN)

### AM Suppression Ratio:

50 dB

### Total Harmonic Distortion

**Mono:** 0.15%

**Stereo:** 0.25%

### Frequency Response:

30 Hz — 15 kHz, ±1.5 dB

### Stereo Separation:

45 dB at 1 kHz

30 dB at 100 Hz — 10 kHz

## AM

### Tuning Range

**U.S.A. & Canadian models:** 530—1,710 kHz (10 kHz steps)

**European & Australian models:** 522—1,611 kHz (9 kHz steps)

**Worldwide models:** 531—1,602 kHz (9 kHz steps),  
530—1,710 kHz (10 kHz steps)

### Usable Sensitivity:

30 µV

### Image Rejection Ratio:

40 dB

### IF Rejection Ratio:

40 dB

### Signal-to-Noise Ratio:

40 dB

### Total Harmonic Distortion:

0.7%

## GENERAL

### Power Supply

**U.S.A. & Canadian models:** AC 120 V, 60 Hz

**European & Australian models:** AC 230 V, 50 Hz

**Worldwide models:** AC 220-230 V and 120 V switchable,  
50/60 Hz

### Power Consumption

**U.S.A. & Canadian models:** 3.5 A (420 W)

**Other area models:** 250 W

**Dimensions (W × H × D):** 435 × 150 × 322 mm  
17-1/8" × 5-7/8" × 12-11/16"

**Weight:** 9.6 kg, 21.2 lbs.

## REMOTE CONTROL (RC-371M)

### Transmitter:

Infrared

### Signal range:

Approx. 5 meters, 16 ft.

### Power supply:

Two "AAA" batteries (1.5 V × 2)

### Dimensions (W × H × D):

53 × 22 × 197 mm

2-1/16" × 7/8" × 7-3/4"

**Weight:** 132 grams (4.7 oz.) (including batteries)

Specifications and features are subject to change without notice.

# SERVICE PROCEDURES

## 1. Replacing the fuses

 This symbol located near the fuse indicates that the fuse used is fast operating type. For continued protection against fire hazard, replace with same type fuse. For fuse rating refer to the marking adjacent to the symbol.

 Ce symbole indique que le fusible utilise est a rapide. Pour une protection permanente, n'utiliser que des fusibles de même type. Ce dernier est indiqué la qu le présent symbol est apposé.

## CIRCUIT NO. PART NO. DESCRIPTION

F901	252164Y	5A-UL/T-237,Primary <D/W>
F902	252076	3.15A-SE-EAK ,Primary <P/W>
F903	252075	2.5A-SE-EAK,Primary <P>
F991, F992	252163Y	4A-UL/T-237,Secondary<D>
	252077	4A-SE-EAK,Secondary<P/W>
		NOTE : <D> : 120V model only
		<P> : 230V model only
		<W> : Worldwide model

## 2. To Initialize the unit

This device employs a microprocessor to perform various functions and operations. If interference generated by an external power supply, radio wave, or other electrical source results in accident which causes the specified operations and functions to operate abnormally.

To perform a result, please follow the procedure below.

1. Turn the power button "ON"
2. Press and hold down the Video 1 button, then press the SPEAKER A button.
3. After "clear" is displayed, the preset memory and each mode stored in the memory, such as surround, are initialized and will return to the factory settings.

## 3. Safety-check out

(Only U.S.A. model)

After correcting the original service problem, perform the following safety check before releasing the set to the customer. Connect the insulating-resistance tester between the plug of power supply cord and the screw on the back panel.

Specifications: 3.3 Mohm±10% at 500V.

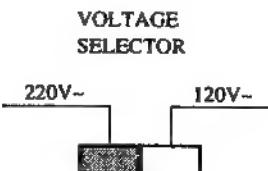
## 4. Change of voltage

Worldwide models are equipment with a voltage selector to conform with local power supplies. This switch is located on the back panel.

Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on.

This switch is set to 220V at the factory. Voltage is changed by

sliding the groove in the switch with the screwdriver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on.



## 5. Memory preservation

This unit does not require memory preservation batteries. A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unplugged.

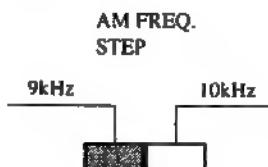
The unit must be plugged in and the power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory, the power switch must be turned on and off a few times each month to keep the back-up system operative.

The period of the time during which memory contents are preserved after power has last been turned off varies depending on climate and placement of the unit. On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shortened when the unit is exposed to very high humidity or used in an area with an extremely humid climate.

## 6. Setting the tuning step frequency

Worldwide models are equipped with a step band selector switch. This switch is located on the back panel. This switch is set to 9 kHz at the factory, but may have to be reset to 10 kHz depending on the area where the unit is used.

AM band step  
Europe: 9 kHz  
U.S.A.: 10 kHz

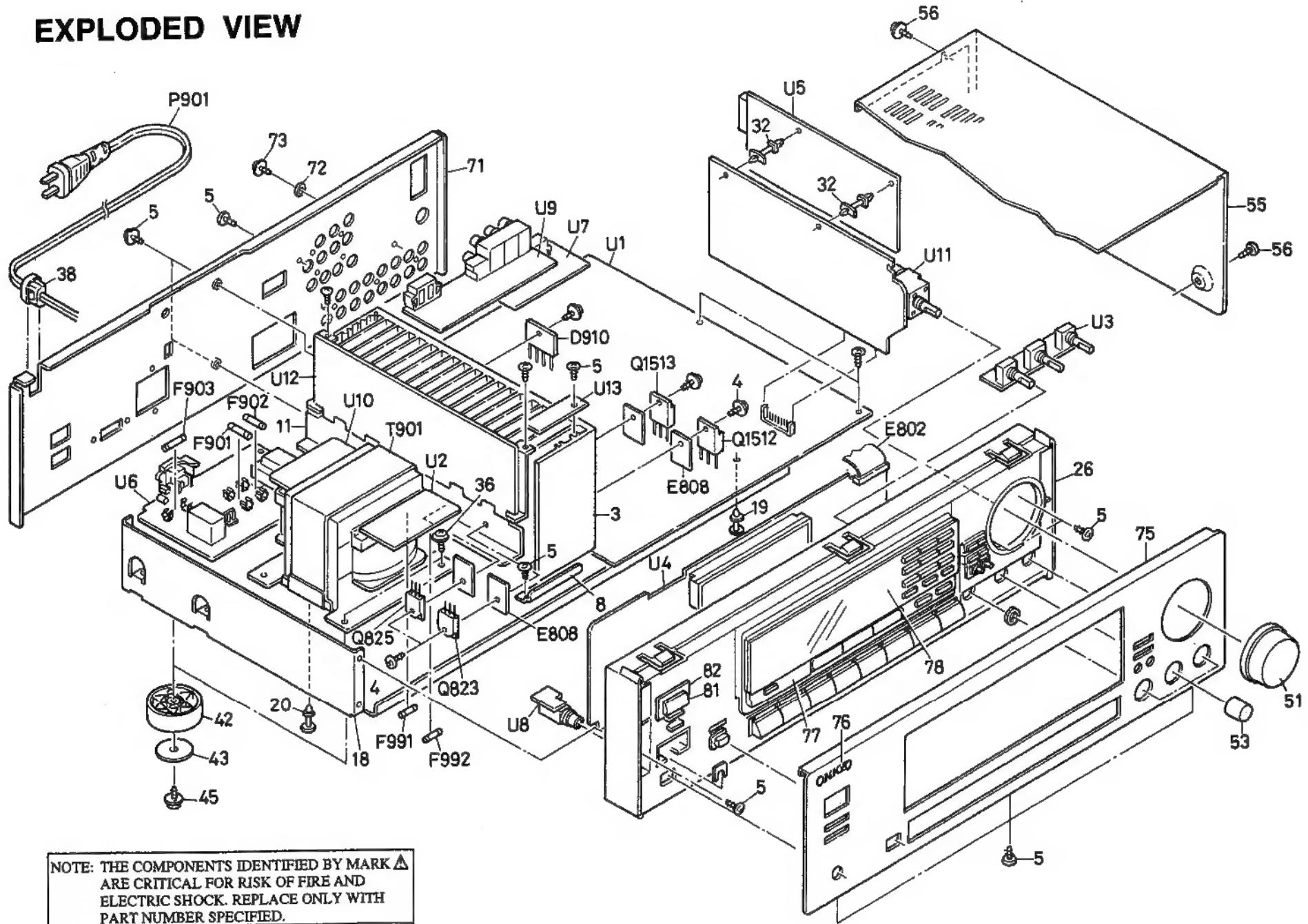


## 7. Changing the band step

With the exception of the worldwide models, a tuning step selector switch is not provided. When you change the band step, change the parts as shown below.

FM	To 100kHz	To 50kHz
AM	To 10kHz	To 9kHz
R727	Open	Short
R724	3.3kohm	Remove

## **EXPLODED VIEW**



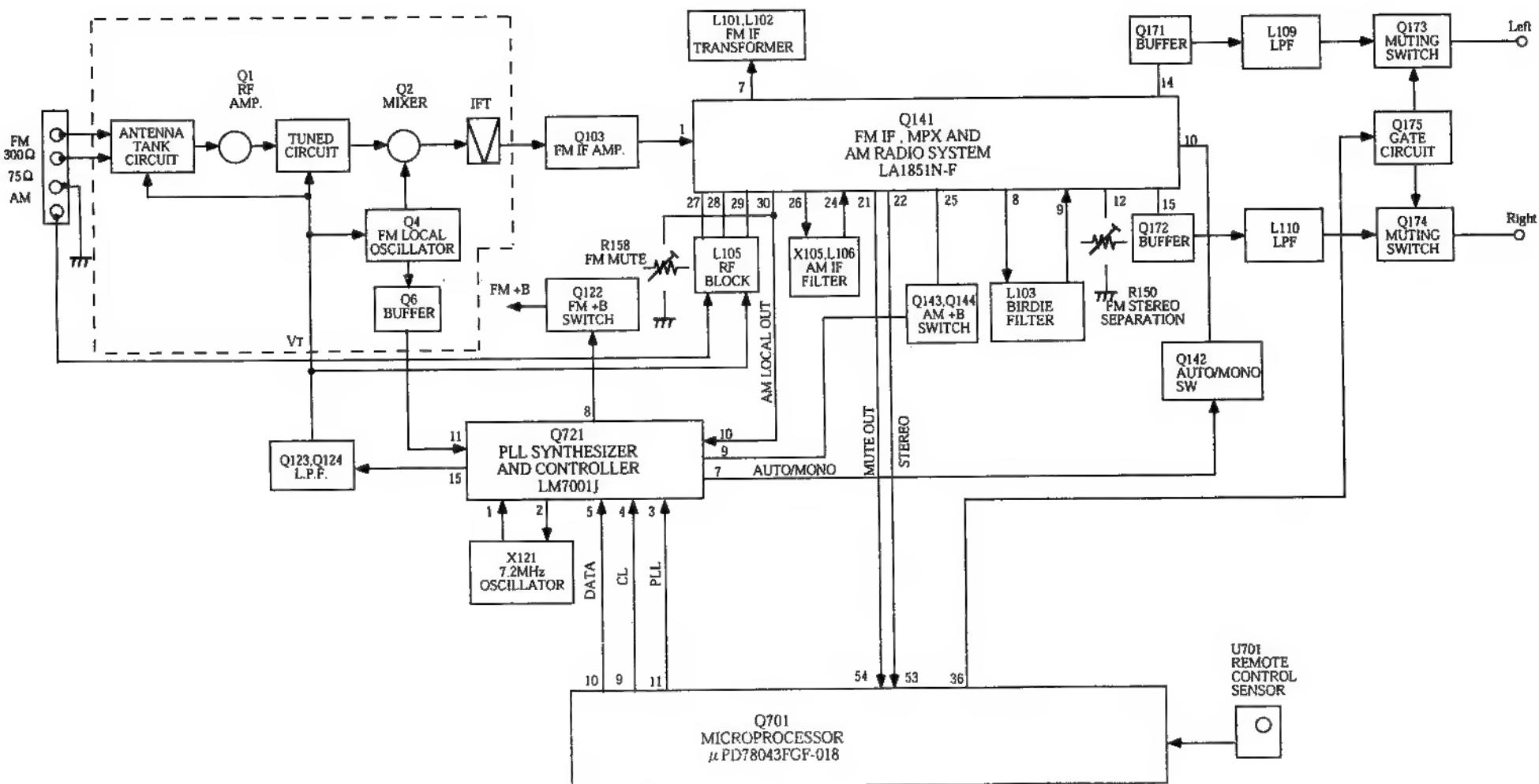
# PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
3	27160375	Heatsink	Q1512	2202843 or	* 2SC5242-O or
4	801433	3SMS8W.SW+14B(BC).Special screw	Q523.Q524	2202842	* 2SC5242-R.Transistor
5	838130088	3TTB+8B,Self-tapping screw	Q1513	2202833 or	* 2SA1962-O or
8	27141671	Retainer	Q525.Q526	2202832	* 2SA1962-R.Transistor
11	27180376	Heatsink S	Q823.Q824	2202923 or	* 2SC5196-O or
17	27191044	KGPS-8RF.Holder	Q823.Q824	2202922	* 2SC5196-R.Transistor
18	27100320B	Chassis	Q825.Q826	2202913 or	* 2SA1939-O or
19	27190503A	KCLS-8RF.Holder	Q825.Q826	2202912	* 2SA1939-R.Transistor
20	27190266	KCLS-12RF.Holder	T901	2301323	▲ NFT-1337D.Power transformer <D>
24	28175225	Isolated plate	2301324	▲ NFT-1337P.Power transformer <PT/A>	
26	27111068	Front bracket <S>	2301325	▲ NFT-1337DG.Power transformer <W>	
	27110952	Front bracket <B>	U1	1A771533-1A	NAAR-6233-1A.Main circuit pc board ass'y <D>
32	27190896	KGLS-10S.Holder		1A771533-1B	NAAR-6233-1B.Main circuit pc board ass'y <P>
36	830440089	4TTC+8C(BC).Self-tapping screw		1A771533-1C	NAAR-6233-1C.Main circuit pc board ass'y <T/W/A>
38	27300750	▲ #2271,Streinrelief	U2	1A771534-1A	NAETC-6234-1A.Secondary circuit pc board ass'y <D>
42	27175319A	Leg		1A771534-1B	NAETC-6234-1B.Secondary circuit pc board ass'y <P>
43	28141332	Cushion		1A771534-1C	NAETC-6234-1C.Secondary circuit pc board ass'y <T/W/A>
45	831430088	3TTW+8B(BC).Self-tapping screw	U3	1A771535-1A	NAETC-6235-1A.Tone volume pc board ass'y <D>
51	28325457	Knob, Volume <S>		1A771535-1B	NAETC-6235-1B.Tone volume pc board ass'y <P>
	28325456	Knob, Volume <B>		1A771535-1C	NAETC-6235-1C.Tone volume pc board ass'y <T/W/A>
53	28325455	Knob, Tone <S>	U4	1A771536-1A	NADIS-6236-1A.Display circuit pc board ass'y <D>
	28325454	Knob, Tone <B>		1A771536-1B	NADIS-6236-1B.Display circuit pc board ass'y <P>
■	28184666	Top cover <S>		1A771536-1C	NADIS-6236-1C.Display circuit pc board ass'y <T>
	28184663	Top cover <B>		1A771536-1D	NADIS-6236-1D.Display circuit pc board ass'y <W>
56	838230088	3TTB+8B(NI).Nickel screw <S>	U5	1A771536-1E	NADIS-6236-1E.Display circuit pc board ass'y <A>
	838430088	3TTB+8B(BC).Self tapping screw <B>		1A771537-1A	NARF-6237-1A.Tuner circuit pc board ass'y <D>
71	27122450	Rear panel <D>		1A771537-1B	NARF-6237-1B.Tuner circuit pc board ass'y <P>
	27122451	Rear panel <P>		1A771537-1C	NARF-6237-1C.Tuner circuit pc board ass'y <T>
	27122454	Rear panel <T>		1A771537-1D	NARF-6237-1D.Tuner circuit pc board ass'y <W>
	27122452	Rear panel <W>		1A771538-1E	NARF-6237-1E.Tuner circuit pc board ass'y <A>
	27122453	Rear panel <A>	U6	1A771538-1A	NAPS-6238-1A.Primary circuit pc board ass'y <D>
72	87643010	W3*10F(BC).Washer		1A771538-1B	NAPS-6238-1B.Primary circuit pc board ass'y <P>
73	838230088	3TTB+8B(NI).Nickel screw		1A771538-1C	NAPS-6238-1C.Primary circuit pc board ass'y <T>
75	27212001	Front panel <S>		1A771538-1D	NAPS-6238-1D.Primary circuit pc board ass'y <W>
	27211994	Front panel <D>		1A771538-1E	NAPS-6238-1E.Primary circuit pc board ass'y <A>
	27211995	Front panel <P/A>	U7	1A771539-1A	NAETC-6239-1A.Video terminal pc board ass'y <D>
	27211996	Front panel <T/W>		1A771539-1B	NAETC-6239-1B.Video terminal pc board ass'y <P>
76	28135245	Badge <S>		1A771539-1C	NAETC-6239-1C.Video terminal pc board ass'y <T>
	28135244	Badge <B>		1A771539-1D	NAETC-6239-1D.Video terminal pc board ass'y <W>
77	27215302	Decorative frame <S>		1A771539-1E	NAETC-6239-1E.Video terminal pc board ass'y <A>
	27215273	Decorative frame <B>	U8	1A771540-1A	NAETC-6240-1A.Headphone terminal pc board ass'y <D>
78	28191778	Clear plate <S>		1A771540-1B	NAETC-6240-1B.Headphone terminal pc board ass'y <P>
	28191752A	Clear plate <B>		1A771540-1C	NAETC-6240-1C.Headphone terminal pc board ass'y <T>
81	28325458	Knob, Power <S>		1A771540-1D	NAETC-6240-1D.Headphone terminal pc board ass'y <W>
	28325451	Knob, Power <P/T/W/A>		1A771540-1E	NAETC-6240-1E.Headphone terminal pc board ass'y <A>
82	27267956	Guide, Power <S>	U9	1A771541-1A	NAETC-6241-1A.Terminal pc board ass'y <D>
	27267955	Guide, Power <P/T/W/A>		1A771541-1B	NAETC-6241-1B.Terminal pc board ass'y <P>
D910	22330274	▲ RS603M or		1A771541-1C	NAETC-6241-1C.Terminal pc board ass'y <T>
D910 or	22380038	▲ RBV602,Silicon diode		1A771541-1D	NAETC-6241-1D.Terminal pc board ass'y <W>
E801	260208	Binder		1A771541-1E	NAETC-6241-1E.Terminal pc board ass'y <A>
E802	2047352012	NCF7-352012,Flat cable	U10	1A771542-1A	NAETC-6242-1A.Transformer pc board ass'y <D>
E808	223024	▲ AC238,Isolated sheet		1A771542-1B	NAETC-6242-1B.Transformer pc board ass'y <P>
F901	252164	▲ 5A-UL/T-237.Fuse <D/W>		1A771542-1C	NAETC-6242-1C.Transformer pc board ass'y <T>
F902	252078	▲ 3.15A-SE-EAK,Fuse <P/T/W/A>		1A771542-1D	NAETC-6242-1D.Transformer pc board ass'y <W>
F903	252075	▲ 2.5A-SE-EAK,Fuse <P/T>	U11	1A771542-1E	NAETC-6242-1E.Transformer pc board ass'y <A>
F991,F992	252077	▲ 4A-SE-EAK,Fuse <D>		1A771594-4A	NAAF-5894-4A.Dolby circuit pc board ass'y <D>
P501a	880025-1	Plastic rivet		1A771594-4B	NAAF-5894-4B.Dolby circuit pc board ass'y <P/T/A>
P901	253192HIT	▲ AS-UC-6#18(SPT-2).Power supply cord <D>		1A771594-4C	NAAF-5894-4C.Dolby circuit pc board ass'y <W>
	253193HIT	▲ AS-CEE,Power supply cord <P/T>	U12	1A771595-4A	NAAF-5895-4A.Rear Amplifier pc board ass'y <D>
	253233KAW	▲ AS-CEE-2.Power supply cord <W>		1A771595-4B	NAAF-5895-4B.Rear Amplifier pc board ass'y <P/T/A>
	253197HIT	▲ AS-SAA.Power supply cord <A>		1A771595-4C	NAAF-5895-4C.Rear Amplifier pc board ass'y <W>
P904,P905	25051570	▲ NSCT-2P1357,AC outlet <A>	U13	25136243	NAETC-6243.Holder for lead wire

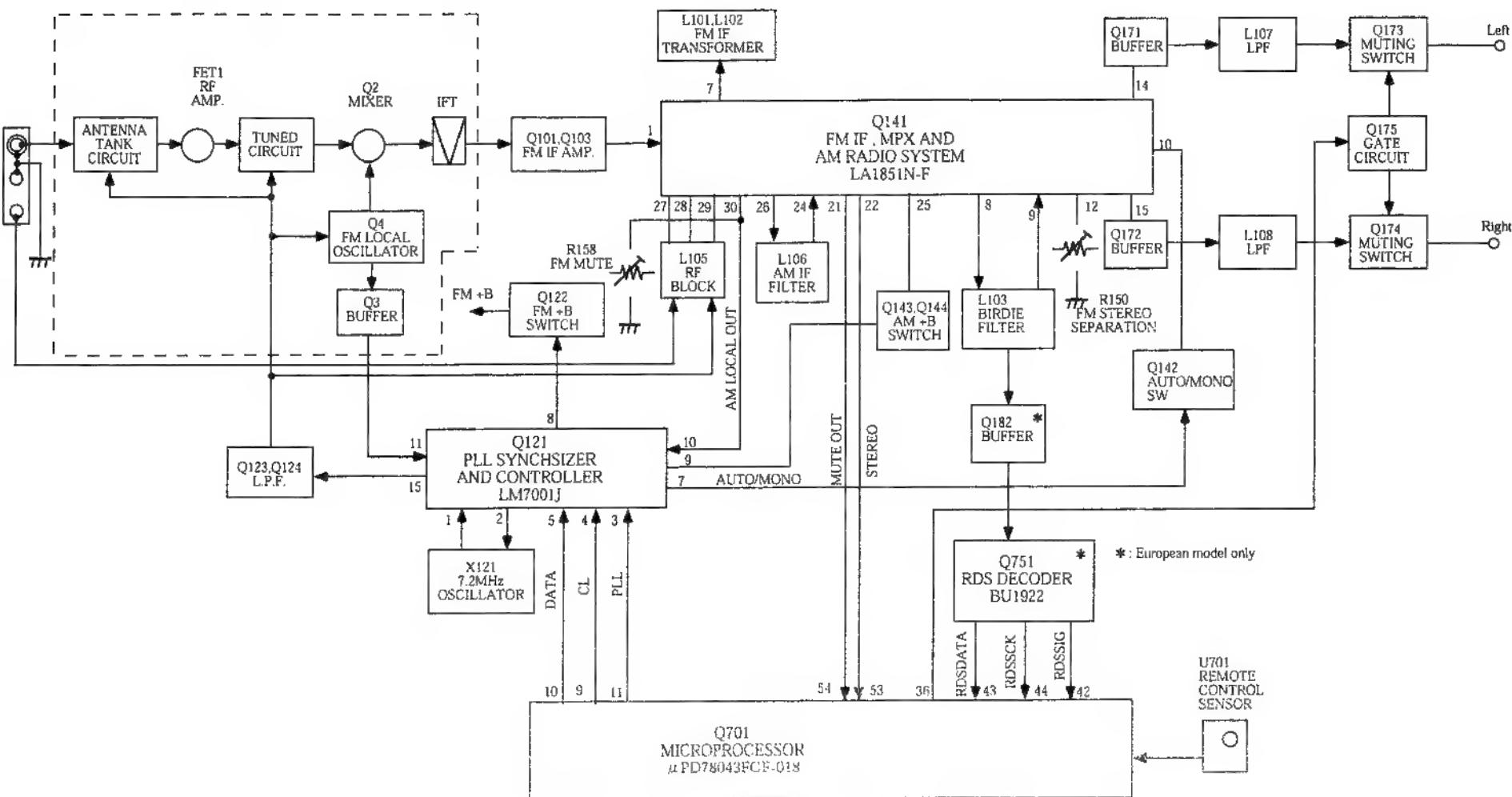
NOTE: <D>:120V model only  
 <P>:230V model only  
 <W>:Taiwanese model only  
 <T>:Asian model only  
 <A>:Australian model only  
 <B>:Black model only  
 <S>:Silver model only

# BLOCK DIAGRAM

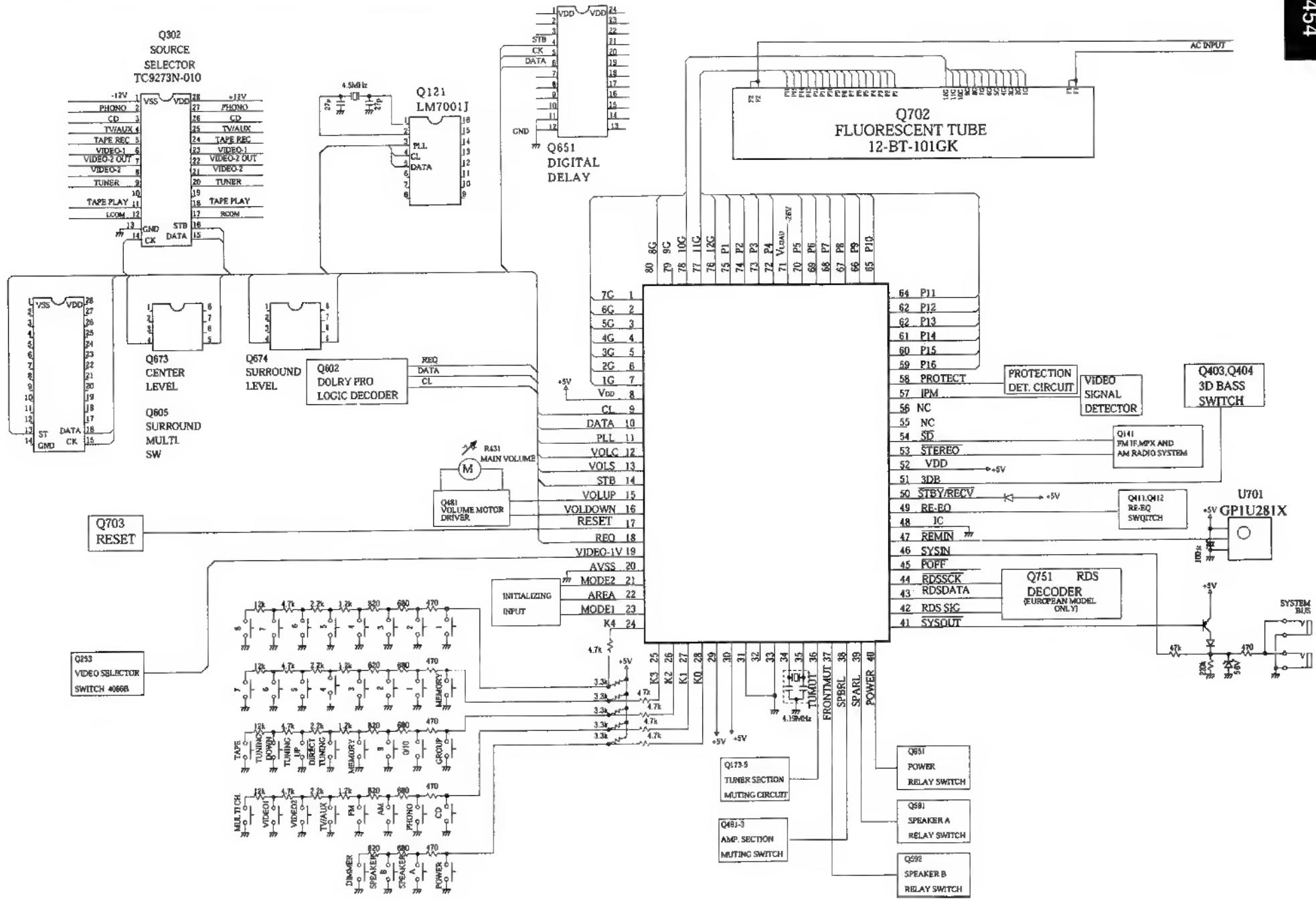
TUNER SECTION  
120V MODEL



## OTHER MODELS



# **MICROPROCESSOR CONNECTION DIAGRAM**



# MICROPROCESSOR TERMINAL DESCRIPTION

Pin No.	Function	Descriptions
1-7	7G-1G	Grid output terminals
8	VDD	Positive power supply terminal (+5V)
9	CL	Clock output terminal.
10	DATA	Data output terminal.
11	PLL	Chip enable output terminal for PLL IC
12	VOLC	Clock output terminal for electro volume of center channel.
13	VOLS	Clock output terminal for electro volume of surround channels.
14	STB	Strobe output terminal
15	VOLUP	Volume control output terminal
16	VOLDOWN	Volume control output terminal
17	RESET	System reset input terminal
18	REQ	Request terminal for Digital delay and Dolby ICs
19	VIDEO-1V	Video signal selector terminal
20	AVSS	Ground terminal for A/D converter
21	MODE2	Initializing input terminal
22	AREA	Initializing input terminal for region of frequency range
23	MODE1	Initializing input terminal
24	K4-K0	Key input terminals
29	AVDD	Analog power supply terminal (+5V)
30	AVREF	Reference voltage input terminal for A/D converter
31	XT1	Crystal connection terminals for subsystem clock
32	XT2	Not used.
33	VSS	Ground terminal
34	X1	Crystal connection terminals for main system clock
35	X2	Connect the 4.19MHz ceramic oscillator.
36	TUMUT	Muting output terminal for tuner section
37	FRONTMUT	Muting output terminal for amplifier of front channels.
38	SPBRL	Speaker relay B control output terminal
39	SPARL	Speaker relay A control output terminal
40	POWER	Power source control output terminal
41	SYSOUT	System code output terminal
42	RDSSIG	Detection input terminal for RDS broadcast
43	RDSDATA	Data input terminal for RDS broadcast
44	RDSSCK	Clock input terminal from RDS demodulator
45	DSPSCK	Clock output terminal for KARAOKE IC.
43	DSPDATA	Data output terminal for KARAOKE IC.

Pin No.	Function	Descriptions
44	DSPCS	Chip select output terminal for KARAOKE IC.
45	POFF	Power failure detection input terminal
46	SYSIN	System code input terminal
47	REMINT	Remote control signal input terminal
48	IC	Internal connection terminal
49	RE-EQ	RE-EQ control output terminal
50	STBY/RECV	STANDBY/RECEIVED indication output terminal
51	3DB	3-D bass control output terminal
52	VDD	Power supply terminal (+5V)
53	STEREO	Stereo broadcast detection input terminal
54	SD	Broadcast detection input terminal
55,56	NC	Not used.
57	IPM	Audio IPM operation input terminal
58	PROTECT	Detection input terminal for protection circuit
59	P16-P5	Segment output terminals
71	VLOAD	Pull-down resistor connection terminal for FIP controller and driver
72	P4-P1	Segment output terminals
76-80	I2G-8G	Grid output terminals

## Volume control output

	15	16
Stop	H	H
Up	H	L
Down	L	H

## FM band

BAND1	BAND0	Region	Frequency Range	Channel space
0	0	Europe	87.50~108.00MHz	50kHz
0	1	Saudi	87.50~108.00MHz	50kHz
1	0	Japan	76.0~90.0MHz	100kHz
1	1	U.S.A	87.5~108MHz	100kHz

## AM band

BAND1	BAND0	AM10K	Region	Frequency Range	Channel space
0	0	0	Europe	522~1611kHz	9 kHz
0	1	0	Saudi	531~1602kHz	9 kHz
1	0	0	Japan	522~1629kHz	9 kHz
1	1	0	U.S.A	522~1629kHz	9 kHz
1	1	1	U.S.A	530~1710kHz	10 kHz

# PRINTED CIRCUIT BOARD PARTS LIST

MAIN CIRCUIT PC BOARD(NAAR-6233-1A/1B/1C)			CIRCUIT NO.	PART NO.	DESCRIPTION
CIRCUIT NO.	PART NO.	DESCRIPTION			
	ICs				
Q281,Q401	22240293 or	NJM4558L-D or	Q583	2211792 or	2SA992-F or
Q402,Q405	22240247	BA15218N	Q591,Q592	2211793	2SA992-E
Q301	222502	NJM4558D-X		2215830 or	KRC105M or
Q302	22240881	TC9273N-010		2213640	DTC123JS
Q407,Q409	222502	NJM4558D-X	Q924	2214905 or	2PA1015-GR or
Q410	222502	NJM4558D-X		2211455	2SA1015-GR
Q411,Q412	22240025	LC4966			<b>Diodes</b>
Q481	22240239	TA7291S	D281,D282	223260 or	1N4148 or
Q921	222780125NEC	MPC78M12HF	D401~D403	223163	1SS133
Q922	222790125	79M12HF	D501~D504	22380260,	RL1N4003,
Q923	222780565JRC	NJM78M56FA	D915~D921	22380032	1SR139-100 or
				22380035	GP104003E
	Transistors		D591,D592	223260 or	1N4148 or
Q1501-Q1503	2215116 or	2SC1775-F or	D912	223163	1SS133
	2211732	2SC1845-F	D911	22380021	RS403L
Q1504,Q1505	2215843 or	KTA1024-O or	D922	224473304	MTZJ33D
Q1507	2211353	2SA949-O	D923,D924	223260 or	1N4146 or
Q1506,Q1508	2215853 or	KTC3206-O or		223163	1SS133
Q1509	2211633	2SC2229-O			<b>Capacitors</b>
Q1510	2203010	2SC5171	C1501	354742209	22 $\mu$ F,16V,Elect.
Q1511	2203000	2SA1930	C1502	374721015	100pF $\pm$ 10%,50V,Plastic
Q1512	2202843 or	* 2SC5242-O or	C1503	354741019	100 $\mu$ F,16V,Elect.
	2202842	* 2SC5242-R	C1504,C1505	354781009	10 $\mu$ F,50V,Elect.
Q1513	2202833 or	* 2SA1962-O or	C1511	374721044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
	2202832	* 2SA1962-R	C1512	354744709	47 $\mu$ F,16V,Elect.
Q1514	2211733 or	2SC1845-E or	C1513~C1517	354781009	10 $\mu$ F,50V,Elect.
	2211732	2SC1845-F	C281~C283	354741009	10 $\mu$ F,16V,Elect.
Q1515	2215864 or	KTC3199-GR or	C284	354780229	2.2 $\mu$ F,50V,Elect.
	2213284	2SC1740S-R	C285,C286	354741009	10 $\mu$ F,16V,Elect.
Q282	2215780 or	KRA103M or	C303,C304	354741009	10 $\mu$ F,16V,Elect.
	2212600	DTA124ES	C307,C308	354721019	100 $\mu$ F,6.3V,Elect.
Q283	2213816,	2SD1450-T,	C309,C310	374726224	6200pF $\pm$ 5%,50V,Plastic
	2212356 or	2SD1302-T or	C311,C312	374721824	1800pF $\pm$ 5%,50V,Plastic
	2213815	2SD1450-S	C313~C316	354741009	10 $\mu$ F,16V,Elect.
Q284	2215810 or	KRC103M or	C391~C393	374721015	100pF $\pm$ 10%,50V,Plastic
	2213160	DTC124ES	C401,C402	354741009	10 $\mu$ F,16V,Elect.
Q285	2215800 or	KRA111M or	C407~C410	374721044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
	2215240	DTA114TS	C413,C414	354741009	10 $\mu$ F,16V,Elect.
Q403,Q404	2211945	2SK246-GR	C415,C416	374721534	0.015 $\mu$ F $\pm$ 5%,50V,Plastic
Q406	2211945	2SK246-GR	C417,C418	374721015	100pF $\pm$ 10%,50V,Plastic
Q413,Q426	2215790 or	KRA107M or	C427,C454	374721044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
	2213090	DTA114YS	C431,C432	354741009	10 $\mu$ F,16V,Elect.
Q423~Q425	2213631	RN1241-A	C433~C436	374721224	1200pF $\pm$ 5%,50V,Plastic
Q427	2215770 or	KRA102M or	C437,C438	354741009	10 $\mu$ F,16V,Elect.
	2213510	DTA114ES	C439,C440	374722224	2200pF $\pm$ 5%,50V,Plastic
Q501~Q506	2215116 or	2SC1775-F or	C451,C457	354741009	10 $\mu$ F,16V,Elect.
	2211732	2SC1845-F	C456,C462	374721044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
Q507~Q510	2215843 or	KTA1024-O or	C458,C459	374721224	1200pF $\pm$ 5%,50V,Plastic
	2211353	2SA949-O	C460,C463	354741009	10 $\mu$ F,16V,Elect.
Q511,Q512	2215853 or	KTC3206-O or	C461	374722224	2200pF $\pm$ 5%,50V,Plastic
Q515~Q518	2211633	2SC2229-O	C465~C467	354741009	10 $\mu$ F,16V,Elect.
Q513,Q514	2215843 or	KTA1024-O or	C501,C502	354741009	10 $\mu$ F,16V,Elect.
	2211353	2SA949-O	C503,C504	374721015	100pF $\pm$ 10%,50V,Plastic
Q519,Q520	2203010	2SC5171	C505,C506	354742219	220 $\mu$ F,16V,Elect.
Q521,Q522	2203000	2SA1930	C507~C510	354781009	10 $\mu$ F,50V,Elect.
Q523,Q524	2202843 or	* 2SC5242-O or	C519,C520	374721044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
	2202842	* 2SC5242-R	C521,C522	354744709	47 $\mu$ F,16V,Elect.
Q525,Q526	2202833 or	* 2SA1962-O or	C525~C528	354774719	470 $\mu$ F,6.3V,Elect.
	2202832	* 2SA1962-R	C581	354721019	100 $\mu$ F,6.3V,Elect.
Q527,Q528	2211733 or	2SC1845-E or	C910	354732219	220 $\mu$ F,10V,Elect.
	2211732	2SC1845-F	C915,C916	3504339,	8200 $\mu$ F,56V,Elect.,
Q529,Q530	2215864 or	KTC3199-GR or		3504280 or	8200 $\mu$ F,56V,Elect. or
	2213284	2SC1740S-R		3504298	8200 $\mu$ F,56V,Elect. <D>
Q581,Q582	2215116 or	2SC1775-F or			
	2211732	2SC1845-F			

**CAUTION:** Replacement of the transistor of mark \*, if necessary, must be made from the same beta group (HFE) as the original type.

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Capacitors</b>		
C915,C916	3504340,	1000 $\mu$ F,56V,Elect..
	3504285 or	10000 $\mu$ F,56V,Elect. or
	3504299	10000 $\mu$ F,56V,Elect.<P/T/W/A>
C917	354753329	3300 $\mu$ F,25V,Elect..
C918	354761029	1000 $\mu$ F,35V,Elect..
C922,C923	354781009	10 $\mu$ F,50V,Elect..
C924,C925	3504314 or	4700 $\mu$ F,35V,Elect. or
	3504310	4700 $\mu$ F,35V,Elect..
C926	354781009	10 $\mu$ F,50V,Elect..
C928,C929	354781019	100 $\mu$ F,50V,Elect..
C932	354741009	10 $\mu$ F,16V,Elect..
<b>Resistors</b>		
R1512,R1513	443526804	68 $\Omega \pm 5\%$ ,1/2W,Metal oxide
R1515	443525604	56 $\Omega \pm 5\%$ ,1/2W,Metal oxide
R1516	443526804	68 $\Omega \pm 5\%$ ,1/2W,Metal oxide
R1519	4500197 or	330 $\Omega \pm 5\%$ ,1/4W or
	4500107	330 $\Omega \pm 5\%$ ,1/4W,Metal
R1522,R1523	4500171 or	2.2 $\Omega \pm 5\%$ ,1/4W,Metal or
	4500055	2.2 $\Omega \pm 5\%$ ,1/4W,Metal
R1524	4000132	RGC55 0.22,Special
R1529	453630824	8.2 $\Omega \pm 5\%$ ,1W,Metal
R1532	5210259	N06HR2KBC,Trimming
R521~R524	443526804	68 $\Omega \pm 5\%$ ,1/2W,Metal oxide
R525,R526	443525604	56 $\Omega \pm 5\%$ ,1/2W,Metal oxide
R527,R528	443526804	68 $\Omega \pm 5\%$ ,1/2W,Metal oxide
R539~R542	4500171 or	2.2 $\Omega \pm 5\%$ ,1/4W or
R567~R570	4500055	2.2 $\Omega \pm 5\%$ ,1/4W,Metal
R543,R544	4500197 or	330 $\Omega \pm 5\%$ ,1/4W or
	4500107	330 $\Omega \pm 5\%$ ,1/4W,Metal
R547,R548	4000132	RGC55 0.22,Special
R555,R556	453630824	8.2 $\Omega \pm 5\%$ ,1W,Metal
R557,R558	443623914	390 $\Omega \pm 5\%$ ,1/2W,Metal oxide
R573,R574	5210259	N06HR2KBC,Trimming
R933	443524704	47 $\Omega \pm 5\%$ ,1/2W,Metal oxide
<b>Relays</b>		
RL501,RL502	25065517	NRL-2P5A-DC24-098
<b>Terminals</b>		
P301,P302	25045538,	NPJ-6PDWR362,
	25045300 or	NPJ-6PDBL159 or
	25045458	NPJ-6PDBL279
P303	25045537,	NPJ-4PDWR361,
	25045303 or	NPJ-4PDBL162 or
	25045460	NPJ-4PDBL281
P501	25060147	NTM-4PDPMN075
P502	25060273 or	NTM-4PDML204 or
	25060161	NTM-4PDML087
<b>Plugs</b>		
P1511	25055038	NPLG-2P29
P211a	25055709	NPLG-13P665
P511,P512	25055038	NPLG-2P29
P612a	25055706	NPLG-10P662
<b>Sockets</b>		
P611a	25051752	NSCT-12P1539
P701b	25052044,	NSCT-35P1831,
	25050975 or	NSCT-35P762 or
	25051842	NSCT-35P1629
JL261a	25051088	NSCT-4P875
JL401a	25051093	NSCT-9P880
JL911a,JL912a	25051111	NSCT-7P898
JL914a	25051108	NSCT-4P895

**NOTE: THE COMPONENTS IDENTIFIED BY MARK ▲ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.**

#### SECONDARY CIRCUIT PC BOARD(NAETC-6234-1A/1B/1C)

CIRCUIT NO.	PART NO.	DESCRIPTION
F991a,F992a	Fuseholders	
	25052087 or	▲ HTF-015 or
	25050065	▲ YSH403T
	Fuses	
P991,F992	252077	▲ 4A-SE-EAK,Fuse <P/T/W/A>
F991,F992	252163	▲ 4A-UL/T-237,Fuse <D>
	Socket	
JL911b	25051111	NSCT-7P898
	Capacitors	
C992,C993	374721044	0.1 $\mu$ F $\pm 5\%$ ,50V,Plastic
C995,C996	374731044	0.1 $\mu$ F $\pm 5\%$ ,50V,Plastic
C997,C998	374721044	0.1 $\mu$ F $\pm 5\%$ ,50V,Plastic
	Resistors	
R991,R992	453530224	2.2 $\Omega \pm 5\%$ ,1/2W,Metal

#### TONE VOLUME PC BOARD(NAETC-6235-1A/1B/1C)

CIRCUIT NO.	PART NO.	DESCRIPTION
C411,C412	374721534	0.015 $\mu$ F $\pm 5\%$ ,50V,Plastic
R400	5131434 or	N12RLC250KWT20Z or
	5104288	N11RLC250KWT20Z,Variable
R419,R421	5132435 or	N14RLCL100KWT20Z or
	5104356	N14RLC100KWT20Z,Variable
JL401b	25051093	NSCT-9P880,Socket

#### DISPLAY CIRCUIT PC BOARD(NADIS-6236-1A/1B/1C/1D/1E)

CIRCUIT NO.	PART NO.	DESCRIPTION
	FL. tube	
Q702	212156	12-BT-101CK
	Remote sensor	
U701	241305	GP1U281X
	ICs	
Q701	22241059	MPD78043FGF-018
Q751	22241124	BU1922 <P>
	Transistors	
Q703	2215820 or	KRC104M or
	221282	DTC144ES
Q705,Q706	2215864 or	: KTC3199-GR or
	2213284	2SC1740S-R
Q707	2215770 or	KRA102M or
	2213510	DTA114ES
Q752	2215820 or	KRC104M or
	221282	DTC144ES <P>
	Diodes	
D701~D705	223260 or	1N4148 or
D708	223163	ISS133
D706,D707	224470562	MT2J5.6B
D709	225290	SEL4110R
D710~D712	223260 or	1N4148 or
	223163	ISS133
D751	223260 or	1N4148 or
	223163	ISS133 <P>
	Coils	
L701~L703	233454K220 or	NCH-1452 220K or
	233526K220	NCH-1561 220K
	Oscillators	
X701	3010163	CST4.19MGW
X751	3010203	AF6146CG <P>
	Capacitors	
C701	3000075	ECCSSR5T473,Super
C702	375524744	0.47 $\mu$ F $\pm 5\%$ ,50V,Plastic
C703,C709	355721019	100 $\mu$ F,6.3V,Elect.
C704	355780109	1 $\mu$ F,50V,Elect.
C706,C707	355780109	1 $\mu$ F,50V,Elect.
C711	355721019	100 $\mu$ F,6.3V,Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
		<b>Capacitors</b>			<b>Capacitors</b>
C751	354721019	100 $\mu$ F,6.3V,Elect. <P>	C001	354741019	100 $\mu$ F,16V,Elect.
C753	354780229	2.2 $\mu$ F,50V,Elect. <P>	C109,C110	374722724	2700pF $\pm$ 5%,50V,Plastic <P/T/W/A>
C754	374725614	560pF $\pm$ 5%,50V,Plastic <P>	C127	354721019	100 $\mu$ F,6.3V,Elect.
		<b>Push switches</b>	C130,C159	354780229	2.2 $\mu$ F,50V,Elect.
S701~S704	25035652	NPS-111-S604	C131	374722234	0.022 $\mu$ F $\pm$ 5%,50V,Plastic
	25035652	NPS-111-S604	C132,C153	354783399	0.33 $\mu$ F,50V,Elect.
	25035652	NPS-111-S604	C133,C142	354741019	100 $\mu$ F,16V,Elect.
	25035652	NPS-111-S604	C145,C154	354741009	10 $\mu$ F,16V,Elect.
S707~S738	25035652	NPS-111-S604	C146	374723324	3300pF $\pm$ 5%,50V,Plastic
S739	25035653	NPS-122-L805 <P/T/W/A>	C147	374721234	0.012 $\mu$ F $\pm$ 5%,50V,Plastic <P/T/W/A>
		<b>Sockets</b>	C147	374721834	0.018 $\mu$ F $\pm$ 5%,50V,Plastic <D>
JL711a	25051090	NSCT-6P877	C149	354780479	4.7 $\mu$ F,50V,Elect.
P701a	25052081	NSCT-35P1868,	C151,C152	354780109	1 $\mu$ F,50V,Elect.
P701a or	25051879 or	NSCT-35P1666 or	C155,C156	374721034	0.01 $\mu$ F $\pm$ 5%,50V,Plastic <D>
P701a or	25050941	NSCT-35P728	C155,C156	374724724	4700pF $\pm$ 5%,50V,Plastic <P/T/A>
		<b>Holder</b>	C155,C156	374725624	5600pF $\pm$ 5%,50V,Plastic <W>
Q702a	27190989	{FL}	C160	354784799	0.47 $\mu$ F,50V,Elect.
			C162,C166	354741009	10 $\mu$ F,16V,Elect.
			C171,C172	354741009	10 $\mu$ F,16V,Elect.
			C173,C174	374721024	1000pF $\pm$ 5%,50V,Plastic <D>
			C177	354780229	2.2 $\mu$ F,50V,Elect.
			C178	354741009	10 $\mu$ F,16V,Elect.
		<b>Resistors</b>	R150	5210261	N06HR5KBC,Trimming
TU001	240098	ENV172D1G1 <D>	R158	5210264	N06HR30KBC,Trimming
	240099	ENV172A0G1 <P/T/W/A>			
		<b>ICs</b>	P101	25060117,	NTM-2PDML051,
Q121	22241076 or	LM7001J or		25060222 or	NTM-2PDML144 or
	22240090	LM7001		25060270	NTM-2PDML201 <P/T/W/A>
Q141	22240983	LA1851N-F		25060195,	NTM-4PDML117,
		<b>Transistors</b>		25060239 or	NTM-4PDML161 or
Q101	2210746	2SC945A-P <P/T/W/A>		25060272	NTM-4PDML203 <D>
Q102	2211723	2SC1923-O	P211b	25051238	NSCT-13P1028
Q122,Q142	2215770,	KRA102M,	TP101	25055038	NPLG-2P29
Q175	2213510 or	DTA114ES or		E856	27150397 <P/T/W/A>
	2214350	RN2202			
Q123	2212445	2SK365-GR			
Q124,Q171	2215864,	KTC3199-GR,			
Q172	2212115 or	2SC2458-GR or			
	2213284	2SC1740S-R			
Q143	2215820 or	KRC104M or			
	221282	DTC144ES			
Q144	2215830 or	KRC105M or			
	2213640	DTC123JS			
Q173,Q174	2215024	2SD1468S-R			
Q182	2215864,	KTC3199-GR,			
	2212115 or	2SC2458-GR or			
	2213284	2SC1740S-R <P>			
		<b>Diode</b>			
D165	224470512	MTZJ5.1B			
		<b>Transformers and coils</b>			
L101	233457	NFIF-4081	D953,D954	22380032 or	1SR139-100 or
L102	233458	NFIF-4082		22380035	GP104003E <P/T/W/A>
L103	233471	NMC-6084 <P/T/W/A>	D952	22380260,	RL1N4003,
L104	233526K220 or	NCH-1561 220K or		22380032 or	1SR139-100 or
	233454K220	NCH-1452 220K	D955	22380035	GP104003E
L105	232174	NMRF-5077		223260 or	1N4148 or
L106	232176	NMIF-6094		223163	ISS133
L107,L108	233484	NMC-4085 <P/T/W/A>	T902		<b>Power transformer</b>
L109,L110	231092	NCH-2140 <D>		2300670A or	△ NPT-1111D or
		<b>Ceramic filters</b>		2301258	△ NPT-1294D <D>
X101,X103	3010071	SFE-10.7MA5 RED		2300671A	△ NPT-1111P <P/T/A>
X102	3010130	SFE10.7MZ2K <P/T/W/A>	F901	252164	△ NPT-1111DG <W>
X104	3010268	CSB456F23	F902	252076	△ 5A-UL/T-237,Fuse <D/W>
		<b>Oscillator</b>	F903	252075	△ 3.15A-SE-EAK,Fuse <P/T/W/A>
X121	3010141	XTL-7.2M			△ 2.5A-SE-EAK,Fuse <P/T>

**CAUTION:** Replacement of the transistor of mark  $\Delta$ , if necessary, must be made from the same beta group (HFE) as the original type.

**CIRCUIT NO.** **PART NO.** **DESCRIPTION**

		<b>Fuseholders</b>
F901a	25052087 or	$\Delta$ HTF-015 or
	25050065	$\Delta$ YSH403T <D/W>
F902a	25052087 or	$\Delta$ HTF-015 or
	25050065	$\Delta$ YSH403T <P/T/W/A>
F903a	25052087 or	$\Delta$ HTF-015 or
	25050065	$\Delta$ YSH403T <P/T>
		<b>Sockets</b>
JL961a	25051088	NSCT-4P875
P903	25051125	$\Delta$ NSCT-4P912 <P/T/W>
	25051126	$\Delta$ NSCT-4P913 <D>
		<b>Plug</b>
P901a	25055675	$\Delta$ NPLG-2P631
		<b>Switch</b>
S901	25065437	$\Delta$ NSS-22157P <W>
		<b>Relay</b>
RL901	25065515 or	$\Delta$ NRL-1P5A-DC12-096 or
	25065561	$\Delta$ NRL-1P5A-DC12-127
		<b>Capacitors</b>
C901	3500191	$\Delta$ DE7150F-103M,IS
C952	354743319	330 $\mu$ F,16V,Elect.
		<b>Resistors</b>
R901	431533355	$\Delta$ 3.3MQ,1/2W,Solid <D>
R951	453530824	8.2 $\Omega$ $\pm$ 5%,1/2W,Metal <P/T/W/A>

**VIDEO TERMINAL PC BOARD(NAETC-6239-1A/1B/1C/1D/1E)**

**CIRCUIT NO.** **PART NO.** **DESCRIPTION**

		<b>IC</b>
Q253	222840661	4066B
		<b>Transistors</b>
Q251,Q252	2215864 or	KTC3199-GR or
	2213284	2SC1740S-R
		<b>Diode</b>
D251	223260 or	1N4148 or
	223163	ISS133
		<b>Capacitors</b>
C251,C252	354721019	100 $\mu$ F,6.3V,Elect.
C255,C256	354724719	470 $\mu$ F,6.3V,Elect.
C257	354721019	100 $\mu$ F,6.3V,Elect.
C259	354741019	100 $\mu$ F,16V,Elect.
		<b>Terminal</b>
P251	25045339 or	NPJ-4PDYE190 or
	25045539	NPJ-4PDYE363
		<b>Plug</b>
JL261b	25055625	NPLG-4P587

**TERMINAL PC BOARD(NAETC-6241-1A/1B/1C/1D/1E)**

**CIRCUIT NO.** **PART NO.** **DESCRIPTION**

		<b>Terminals</b>
P1501	25060271 or	NTM-2PDML202 or
	25060114	NTM-2PDML048
P805	25045537,	NPJ-4PDWR361,
	25045303 or	NPJ-4PDBL162 or
	25045460	NPJ-4PDBL281
		<b>Terminals</b>
P806	25045536,	NPJ-2PDBL360,
	25045298 or	NPJ-2PDBL157 or
	25045456	NPJ-2PDBL277
P807	25045535,	NPJ-1PDBL359,
	25045302 or	NPJ-1PDBL161 or
	25045459	NPJ-1PDBL280
		<b>Socket</b>
JL914b	25050281	NSCT-4P109
		<b>Plug</b>
JL622b	25055631	NPLG-10P593

**NOTE: THE COMPONENTS IDENTIFIED BY MARK  $\Delta$  ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.**

**HEADPHONE TERMINAL PC BOARD(NAETC-6240-1A/1B/1C/1D/1E)**

<b>CIRCUIT NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>
P503	25045255 or	YKB26-5009 or
	25045540	HTJ-064-11D,Terminal

**DOLBY CIRCUIT PC BOARD(NAAF-5894-4A/4B/4C)**

<b>CIRCUIT NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>
	<b>ICs</b>	

Q601,Q603	222502	NJM4558D-X
Q602	22241053	NJW1102AF
Q605	22240800	TC9164AN
Q651	22240995 or	NJU9702 or
	22240686	M65830P
		<b>Transistors</b>
Q671,Q672	222502	NJM4558D-X
Q673,Q674	22241054	M62429PP
		<b>Diodes</b>
Q652	2215163	2SD667A-C
Q675	2213631	RN1241-A
Q677,Q678	2213631	RN1241-A
		<b>Oscillator</b>
X651	3010217	CST2.04MG040
		<b>Capacitors</b>
C601,C602	354780229	2.2 $\mu$ F,50V,Elect.
C605,C606	354781009	10 $\mu$ F,50V,Elect.
C607~C610	374721044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
C611,C612	374726814	680pF $\pm$ 5%,50V,Plastic
C613,C614	354741009	10 $\mu$ F,16V,Elect.
C616,C619	354742209	22 $\mu$ F,16V,Elect.
C617	374724724	4700pF $\pm$ 5%,50V,Plastic
C618,C657	354744709	47 $\mu$ F,16V,Elect.
C620~C622	354741009	10 $\mu$ F,16V,Elect.
C623,C638	354781099	0.1 $\mu$ F,50V,Elect.
C624,C663	354741009	10 $\mu$ F,16V,Elect.
C625	354722219	220 $\mu$ F,6.3V,Elect.
C627	374725614	560pF $\pm$ 5%,50V,Plastic
C628	374721024	1000pF $\pm$ 5%,50V,Plastic
C629,C656	374725624	5600pF $\pm$ 5%,50V,Plastic
C630	374724734	0.047 $\mu$ F $\pm$ 5%,50V,Plastic
C631	354786899	0.68 $\mu$ F,50V,Elect.
C632,C633	354782299	0.22 $\mu$ F,50V,Elect.
C634,C635	354780479	4.7 $\mu$ F,50V,Elect.
C636,C637	354782299	0.22 $\mu$ F,50V,Elect.
C639,C640	374724734	0.047 $\mu$ F $\pm$ 5%,50V,Plastic
C641,C642	354781099	0.1 $\mu$ F,50V,Elect.
C643,C644	374722234	0.022 $\mu$ F $\pm$ 5%,50V,Plastic
C645	354781099	0.1 $\mu$ F,50V,Elect.
C647~C649	354741009	10 $\mu$ F,16V,Elect.
C650	354780479	4.7 $\mu$ F,50V,Elect.
C651	374722224	2200pF $\pm$ 5%,50V,Plastic
C652,C653	374725614	560pF $\pm$ 5%,50V,Plastic
C654,C655	374721044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
C658,C659	374724734	0.047 $\mu$ F $\pm$ 5%,50V,Plastic
C660	354781099	10 $\mu$ F,50V,Elect.
C661,C662	354721019	100 $\mu$ F,6.3V,Elect.
C664	354741019	100 $\mu$ F,16V,Elect.
C667,C668	354741009	10 $\mu$ F,16V,Elect.
C669,C670	354780229	2.2 $\mu$ F,50V,Elect.
C671~C673	354741009	10 $\mu$ F,16V,Elect.
C674	354780229	2.2 $\mu$ F,50V,Elect.
C676,C677	354741009	10 $\mu$ F,16V,Elect.
C685,C686	354721019	100 $\mu$ F,6.3V,Elect.
C687	354741009	10 $\mu$ F,16V,Elect.
C689~C691	354741009	10 $\mu$ F,16V,Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION		Capacitors	
	<b>Resistor</b>			C801,C802	22 $\mu$ F,16V,Elect.
R696	5104392A	N16RFL50KA25F,Variable		C805,C806	47 $\mu$ F,16V,Elect.
	<b>Sockets</b>			C807,C808	100 $\mu$ F,16V,Elect.
JL621a	25051087	NSCT-3P874		C815,C816	10 $\mu$ F,50V,Elect.
JL622a	25051094	NSCT-10P881		C819,C820	10 $\mu$ F,50V,Elect.
P612b	25051235	NSCT-10P1025		C823,C824	0.047 $\mu$ F $\pm$ 5%,50V,Plastic
	<b>Plug</b>			C827,C828	47 $\mu$ F,35V,Elect.
P611b	25055885	NPLG-12P841		C831,C832	220 $\mu$ F,35V,Elect.
<b>REAR AMPLIFIER PC BOARD(NAAF-5895-4A/4B/4C)</b>					
CIRCUIT NO.	PART NO.	DESCRIPTION		Resistors	
	<b>Transistors</b>			R847,R848	4000131 RGC22-0.22 OHMK,Special
Q801,Q802	2215116 ■	2SC1775-F or		R823~R826	68 $\Omega$ $\pm$ 5%,1/2W,Metal oxide
Q809	2211732	2SC1845-F		R833,R834	56 $\Omega$ $\pm$ 5%,1/2W,Metal oxide
Q803~Q806	2215843 or	KTA1024-O or		R835,R836	68 $\Omega$ $\pm$ 5%,1/2W,Metal oxide
Q813,Q814	2211353	2SA949-O		R841,R842	100 $\Omega$ $\pm$ 5%,1/2W,Metal oxide
Q807,Q808	2215853 or	KTC3206-O or		R843~R846	2.2 $\Omega$ $\pm$ 5%,1/2W,Metal
Q817,Q818	2211633	2SC2229-O		R855,R856	8.2 $\Omega$ $\pm$ 5%,1W,Metal
Q810	2215116 or	2SC1775-F or		R859,R860	2.2 $\Omega$ $\pm$ 5%,1/2W,Metal
Q827~Q830	2211732	2SC1845-F			<b>Switch</b>
Q811,Q812	2215864 or	KTC3199-GR or		S961	25065286 NSS-22112 <W>
Q815,Q816	2213284	2SC1740S-R		P801	<b>Terminals</b>
Q819,Q820	2215163	2SD667A-C		25060161 or	NTM-4PDML087 or
Q821,Q822	2215173	2SB647A-C		25060273	NTM-4PDML204
Q823,Q824	2202923 or	* 2SC5196-O or		P961	NPJ-1PDBL263
	2202922	* 2SC5196-R		JL912b	<b>Socket</b>
Q825,Q826	2202913 or	* 2SA1939-O or		25050271	NSCT-7P99
	2202912	* 2SA1939-R		JL621b	<b>Plugs</b>
	<b>Diodes</b>			JL961b	NPLG-3P586
D801,D802	22380260,	RL1N4003,		JL711b	NPLG-4P587
	22380032	1SR139-100 or			NPLG-6P589
	22380035	GP104003E			
<b>NOTES:</b> <D>:120V Model only <P>:European Model only <T>:Asian Model only <W>:Taiwanese Model only <A>:Australian Model only					

## ADJUSTMENT PROCEDURES

### Preparation

#### 1. Input

FM mono: 1kHz, 75kHz devi., 60dB/ $\mu$  V

FM stereo: 1kHz, 67.5kHz devi., 60dB/ $\mu$  V

Pilot signal 19kHz 7.5kHz devi.

AM: 400Hz, 30% mod.

#### 2. Outputs

Connect the non-inductive type resistor of 8 ohms to the all speaker terminals unless otherwise noted.

### 1.IDLING CURRENT ADJUSTMENT

Before Idling adjustment, turn the trimming resistors R573, R574 and R1532 to counter clockwise.

Connect the DC voltmeter to sockets P511,P512 and P1511.

After turn POWER to ON, adjust the trimming resistors R573, R574 and R1532 so that the reading of voltmeter becomes  $1.5 \pm 0.2$ mV.

After adjustment, attach the top cover.

Confirm the voltage of above points after five minutes.

When the voltage is less than 5mV, adjust the above resistors so that the voltage becomes  $5.5 \pm 0.2$ mV.

When the voltage is 5mV to 7mV, adjust the above resistors so that the voltage becomes  $5.7 \pm 0.2$ mV.

When the voltage is more than 7mV, adjust the above resistors so that the voltage becomes  $5.9 \pm 0.2$ mV.

## 2.FM ADJUSTMENT

Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Tuning frequency	Output indicator	Adjustment point	Adjust for	Remarks
FM IF/RF	1	Fig.1	99.0MHz 1kHz 75kHz devi., 65dBf(60dB)	———	99.0MHz	DC voltmeter	L101	0±20mV	FM MUTE/MODE switch:ON/AUTO Repeat the steps 1 and 3 until no further adjustment is necessary.
	2					AC voltmeter	IPT on the front end	Maximum	
	3					Distortion analyzer	L102	Minimum	
Stereo Distortion		Fig.2	99.0MHz Ext. mod.65dBf(60dB)	Channel L or R 1kHz	99.0MHz	Distortion analyzer	IPT on the front end	Minimum	FM MUTE/MODE switch:ON/AUTO Don't turn more than ±180°
Stereo Separation		Fig.2	99.0MHz Ext. mod.65dBf(60dB)	Channel L or R 1kHz	99.0MHz	Oscilloscope	R150	Maximum separation	
Muting Level		Fig.1	99.0MHz 19.2dBf(14dB)	———	99.0MHz	Oscilloscope	R158	Signal output	

## 3.AM ADJUSTMENT

120V model

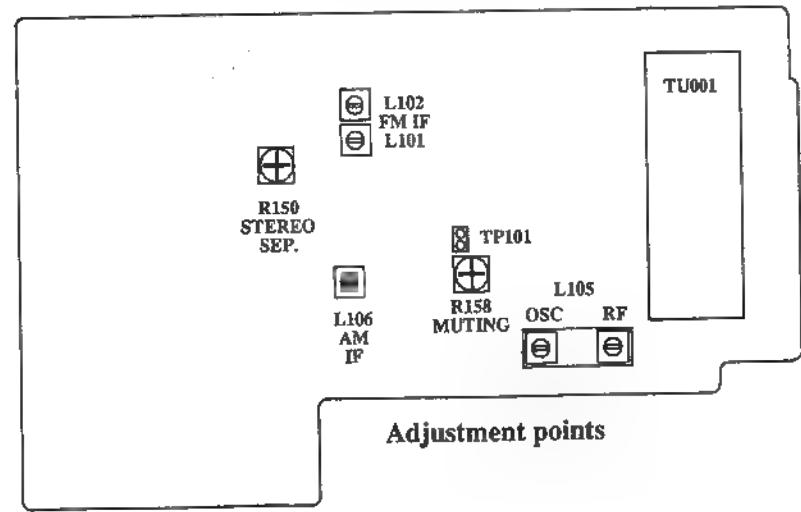
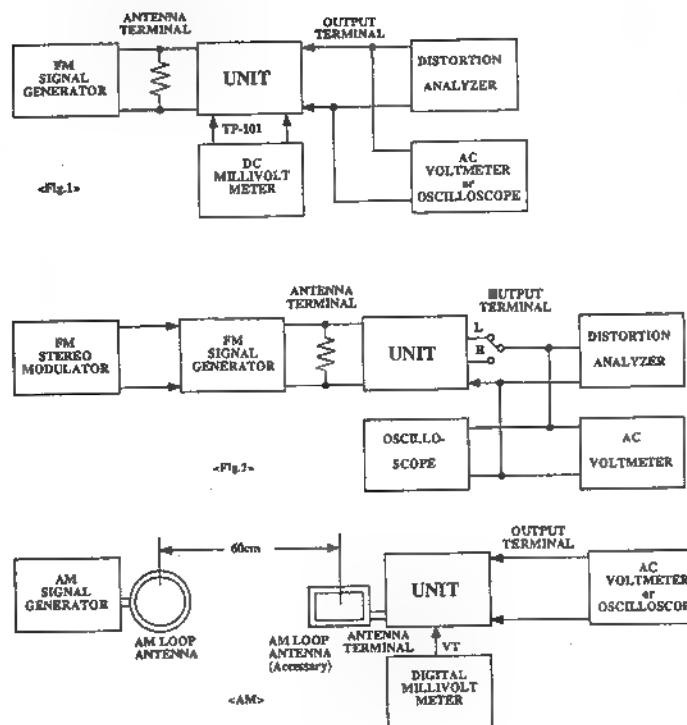
Step	AM SG output	Tuning Frequency	Output Indicator	Adjustment point	Adjust for
1		530kHz	Digital DC voltmeter	OSC coil on RF block L105	1.3±0.2V
2	600kHz 400Hz 30% mod. 60dB/m	600kHz	AC voltmeter	RP coil on RF block L105	Maximum
3	990kHz 400Hz 30% mod. 60dB/m	990kHz	AC voltmeter	L106	Maximum

230V and Worldwide models

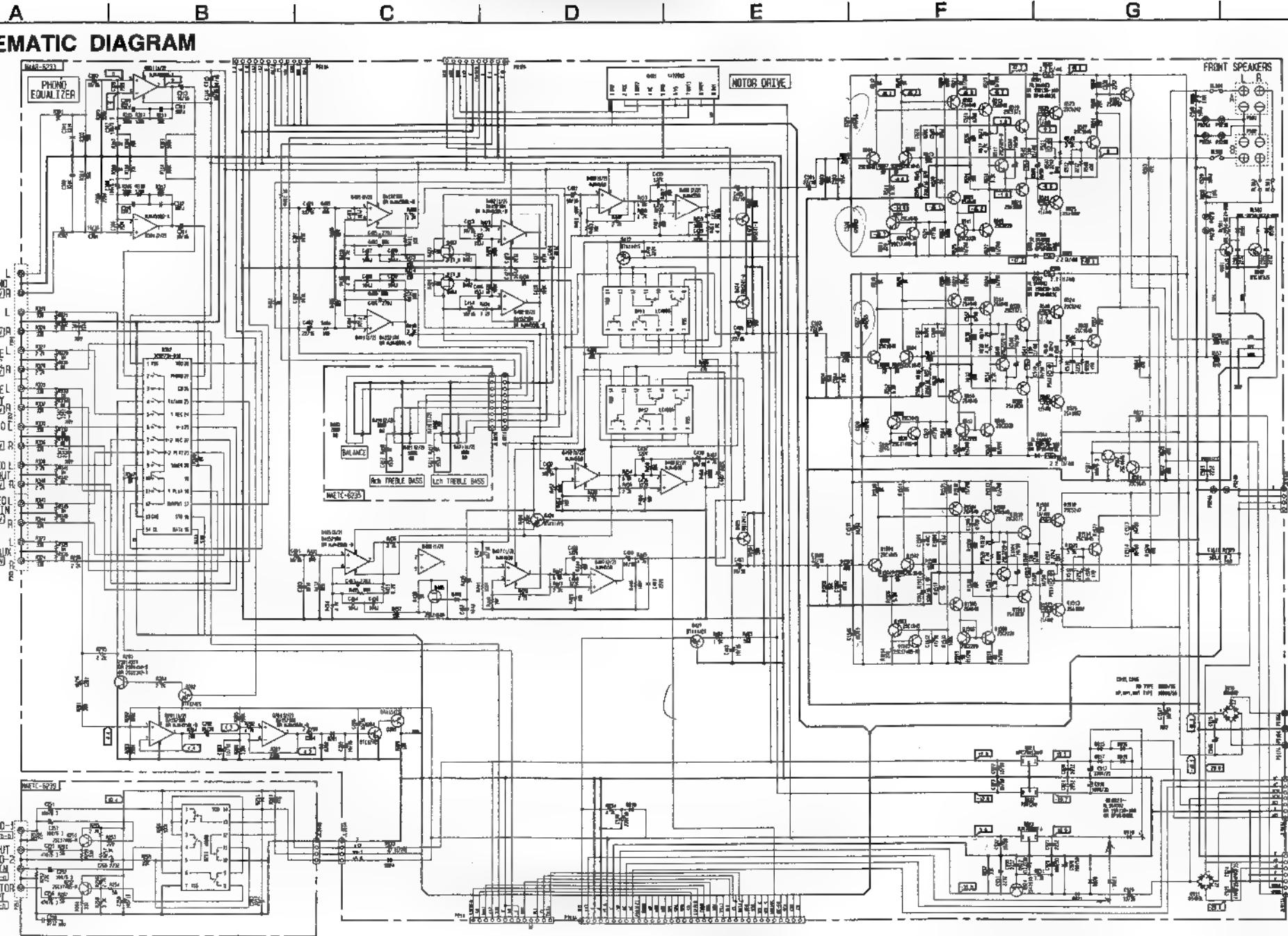
Step	AM SG output	Tuning Frequency	Output Indicator	Adjustment point	Adjust for
1		522kHz or 531kHz	Digital DC voltmeter	OSC coil on RF block L105	1.3±0.2V
2	603kHz 400Hz 30% mod. 60dB/m	603kHz	AC voltmeter	RF coil on RF block L105	Maximum
3	999kHz 400Hz 30% mod. 60dB/m	999kHz	AC voltmeter	L106	Maximum

Reference Specification  
 FM tuned voltage: 87.50MHz ~ 108.00MHz  
 More than 1.2V ~ Less than 10V  
 AM tuned voltage: 530kHz ~ 1710kHz  
 1.3±0.2 ~ Less than 9.0V

Reference Specification  
 FM tuned voltage: 87.50MHz ~ 108.00MHz  
 More than 1.2V ~ Less than 10V  
 AM tuned voltage: 522kHz ~ 1611kHz  
 1.3±0.2 ~ Less than 9.0V  
 (230V model)  
 AM tuned voltage: 531kHz ~ 1602kHz  
 1.3±0.2 ~ Less than 9.0V  
 (Worldwide model)

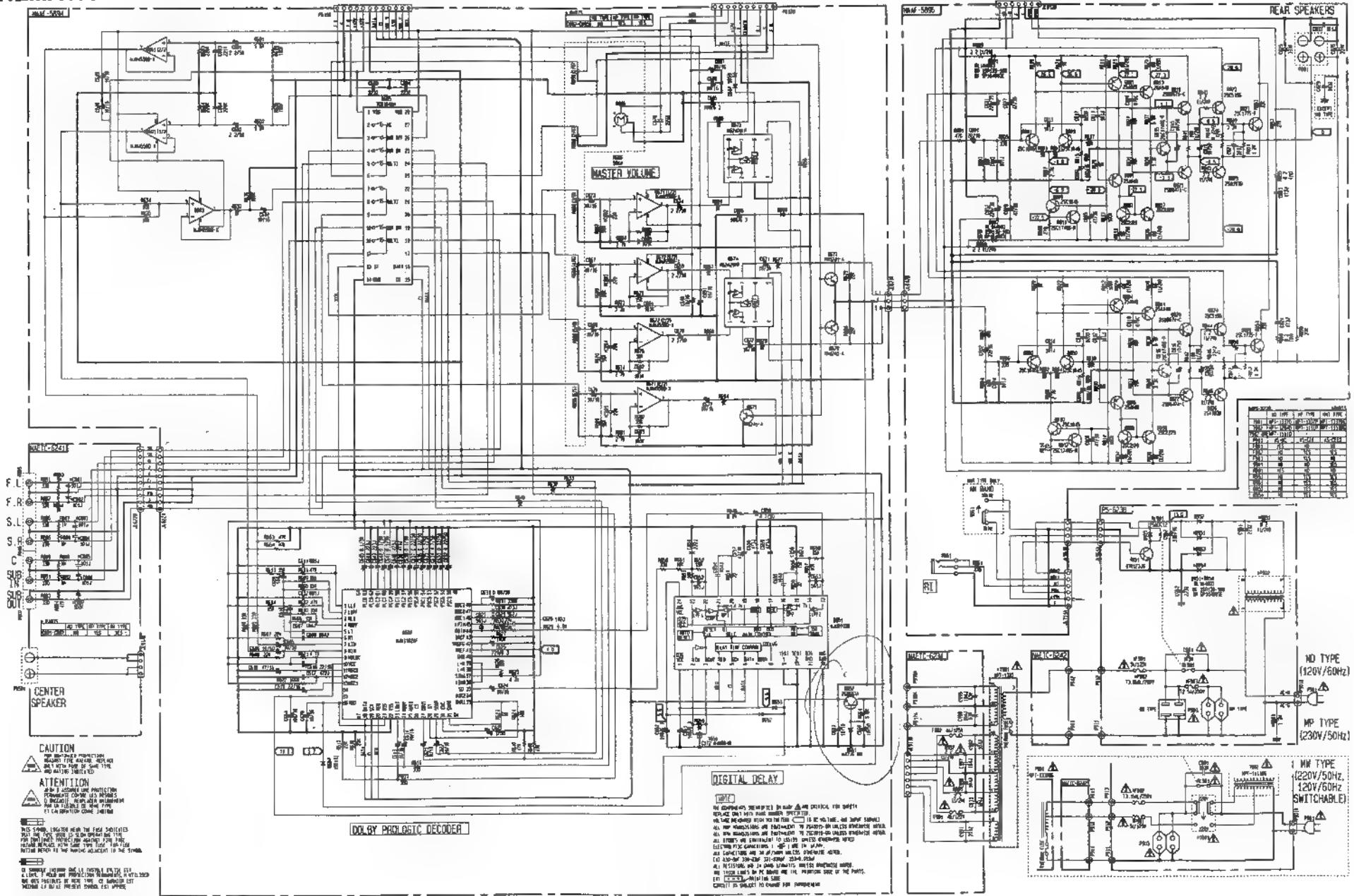


## SCHEMATIC DIAGRAM

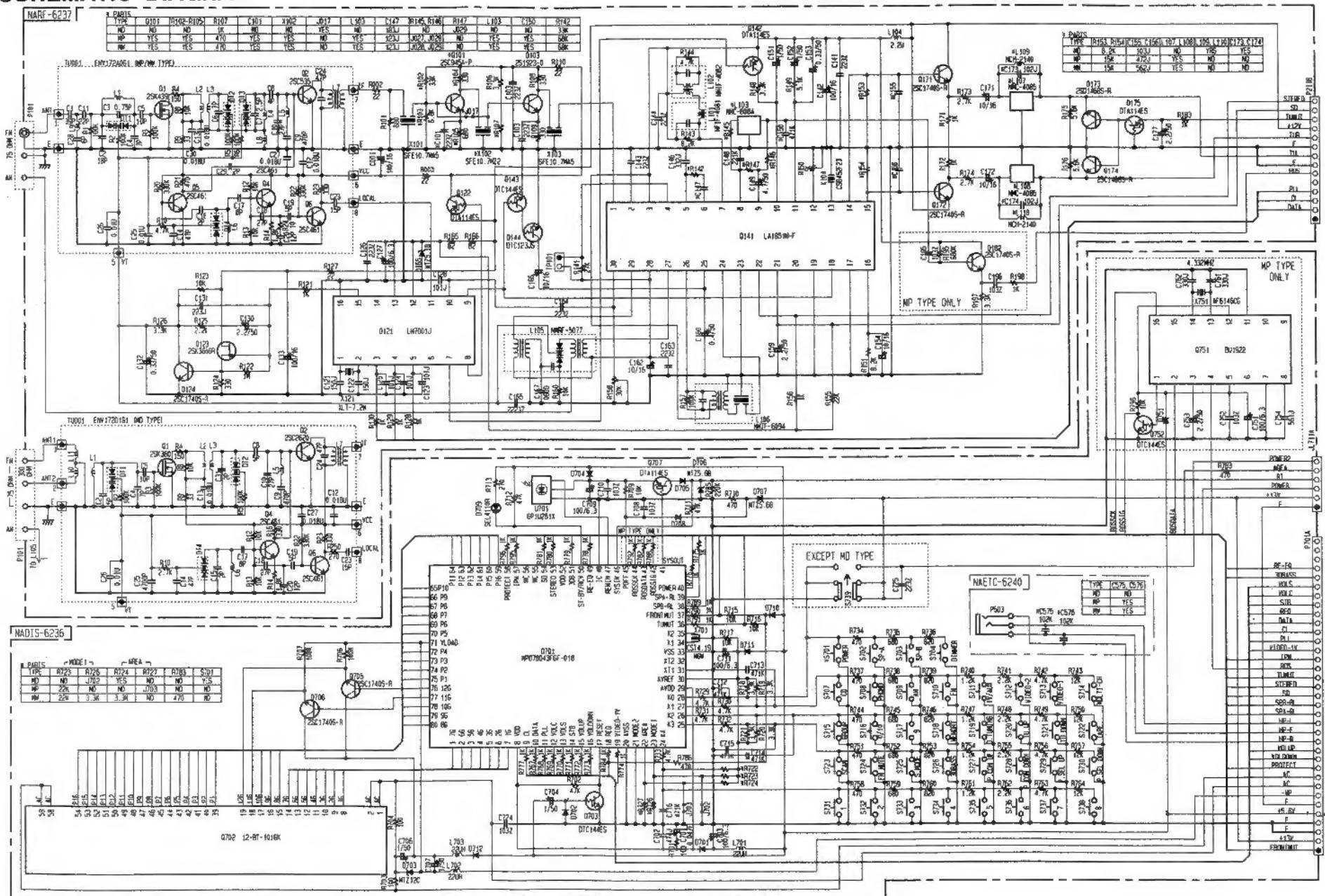


A B C D E F G I H

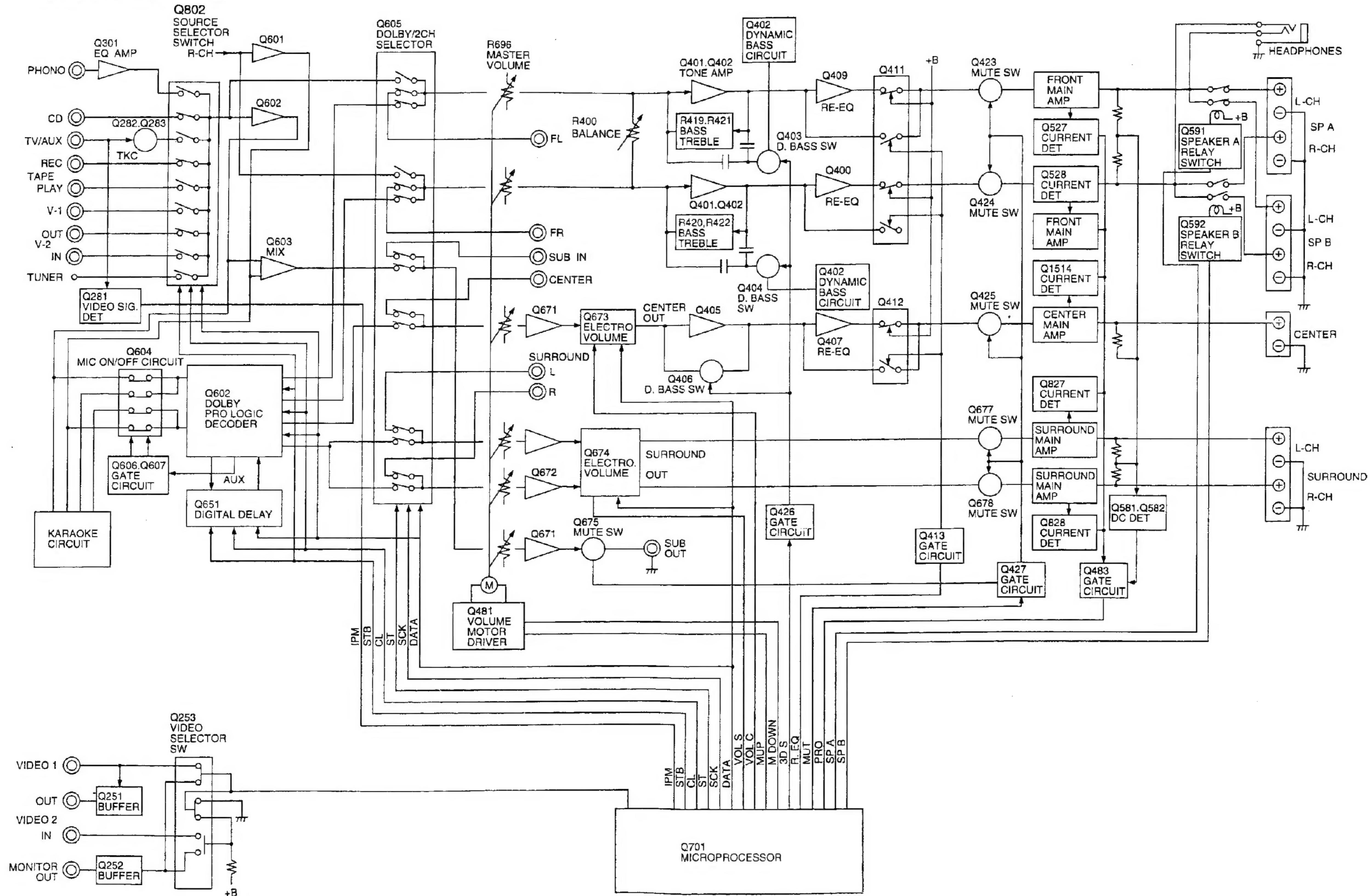
## SCHEMATIC DIAGRAM



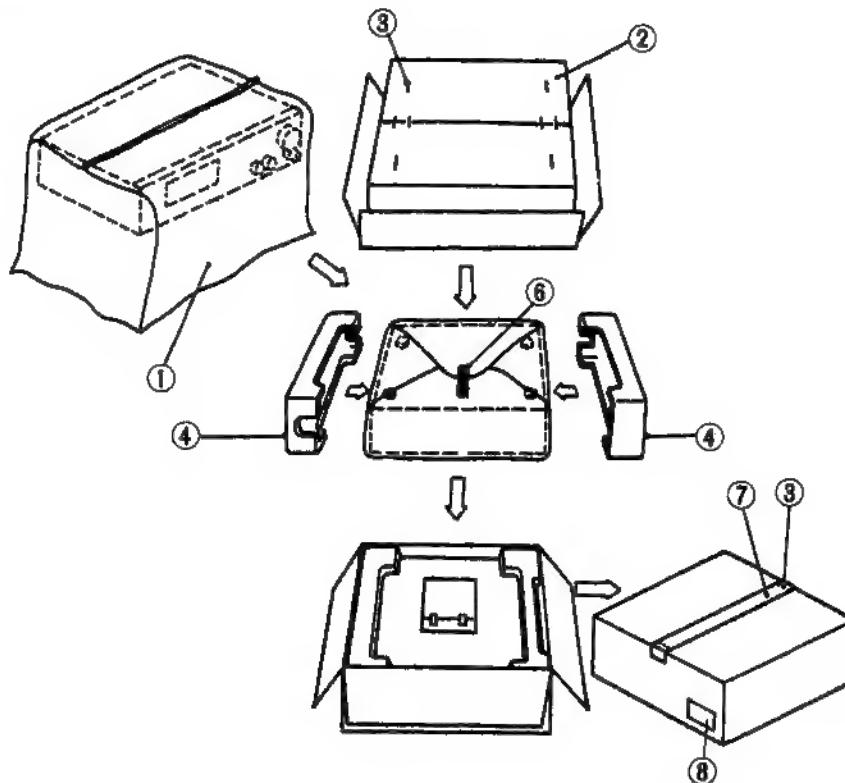
## SCHEMATIC DIAGRAM



# BLOCK DIAGRAM



# PACKING VIEW



REF. NO.	PART NO.	DESCRIPTION
1	29100034-1A	850*650,Styren bag
2	29053280	Carton box <S>
2	29053266	Carton box <D>
2	29053268	Carton box <P>
2	29053267	Carton box <W/T/A>
3	282301	Staple
4	29091763A	Pad ass'y
6	261504	Paper tape
7	29110071	PP tape
8	29362276	Label EAN <P/T/W/A>
8	29362294	Label EAN <S>
8	29362275	Label UPC <D>
		Accessory bag ass'y
	232140	NMA-3057,AM loop antenna
	24140371	RC-371M,Remote control
	25055018	CV-K-1,Conversion plug <W>
	25065462	YAE21-0237,FM antenna adaptor <T/W/A>
	29100097-1A	350*250,Styren bag
	292111	FM antenna <D>
	292112	FM antenna <P/T/W/A>
	29342556	Instruction manual E
	29342557	Instruction manual U3FSI <P>
	29342558	Instruction manual U3GSWD <P>
	29342559	Instruction manual T <T/W>
	29358002K	Servie station list <D>
	29365019B	Warranty card <D>
	3010124	UM-4,Two batteries

NOTE: <D>:120V model only  
 <P>:230V model only  
 <W>:Taiwanese model only  
 <T>:Asian model only  
 <A>:Australian model only  
 <B>:Black model only  
 <S>:Silver model only

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